



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4

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4WD-SSMB

MEMORANDUM

SUBJECT: Dubose Oil Products Company Superfund Site
Five-Year Review

FROM: Randa Chickakli, RPM
South Site Management Branch

THUR: Curt Fehn, Chief 
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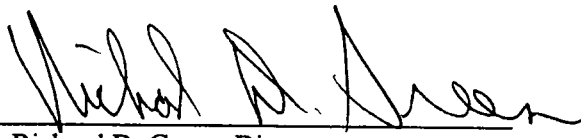
TO: Richard D. Green, Director
Waste Management Division

Attached please find the Five-Year review Report for the Dubose Oil Products Company Superfund Site in Cantonment., Escambia County, Florida. Section 121(C) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, requires that if a remedial action is taken that results in any hazardous substances, pollutants, or contaminants remaining at the site, the Environmental Protection Agency (EPA) shall review the remedial action no less often than each five years after initiation of the remedial action to assure that human health and the environment are being protected by the remedial action being implemented.

Soil and groundwater contamination are addressed at the Dubose Oil Products Company Site. The selected remedy for the soil component included onsite biodegradation of contaminated soil. The Remedial Action commenced in June 1993 and the Preliminary Closeout Report was signed September 25, 1995 with the completion of soil treatment (achievement of soil cleanup goals). Long term groundwater and surface water monitoring was implemented in October 1995 and is continuing with quarterly monitoring.

Based on the present site conditions, the review of ongoing quarterly monitoring data, and the interviews conducted during the Five-Year Review, the remedy is expected to meet the requirements of the Record of Decision (ROD) to ensure protectiveness. The attached Five-Year Review documents the current conditions at the site and states that there are no indications of potential remedy failure or deficiencies and EPA recommends continuing quarterly monitoring and erosion control under the original Operation and Maintenance Plan until Remedial Action Objectives are achieved as specified in the ROD.

Attachment

Approved by: 

Richard D. Green, Director
Waste Management Division
US EPA Region 4

Date: 

I. INTRODUCTION

The Environmental Protection Agency (EPA) has conducted a five-year review of the remedial action implemented at the Dubose Oil Products Company (DOPC) Superfund Site in Cantonment, Escambia County, Florida. The primary purpose of the review is to determine whether the remedy remains protective of human health and the environment. Five-year review reports identify deficiencies, if any, and recommendations to address them. Five-year review reports document the evaluation of the implementation of the remedy and operation and maintenance, as well as the continued appropriateness of remedial action objectives, including cleanup levels at a site.

This review is required by statute. Section 121(C) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and Section 300.430 (f) (4) (ii) of the National Oil and Hazardous Substance Contingency Plan (NCP), require that periodic (no less often than every five years) reviews be conducted for sites where hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure following the completion of all remedial actions.

EPA expects contamination in groundwater and surface water to naturally attenuate to health-protective levels over time. However, since groundwater and surface water contamination remains at the Site above levels allowing for unlimited use and unrestricted exposure, a statutory five-year review was conducted.

This is the first five-year review for the DOPC Site. The trigger for this statutory review is the initiation of remedial action on June 24, 1993 (actual onsite construction date). Construction activities were completed on September 25, 1995. Groundwater and surface water monitoring is ongoing, and a Final Close Out Report is expected in December 1999.

EPA has established a tiered approach to conducting five-year reviews, which allows reviews to be tailored to the status of activities onsite and to site-specific considerations. Four levels of review have been established — 1, 2, 3, and 1a — that detail the type of activities which should take place. Level 1 represents the fundamental review type, and is appropriate for most sites where construction is complete. Levels 2 and 3 represent enhanced levels of review, needed to address site-specific considerations. A recalculation of risk is a typical feature of a level 2 review. A new risk assessment is a typical feature of a level 3 review. Level 1a reviews, which were developed for sites with an ongoing response, generally apply to sites where construction is not complete. A site visit, interviews, and an ARARs review are not needed at the 1a review level. A level 1 review was conducted at the DOPC Site.

II. CHRONOLOGY OF EVENTS

Site Discovery	September 1, 1980
Preliminary Assessment/Site Investigation	September 1, 1982
Hazard Ranking System Package	November 22, 1983
Proposal to National Priorities List (NPL)	October 15, 1984
Final on NPL	June 10, 1986
Remedial Investigation/Feasibility Study (RI/FS) Start	February 1988
RI/FS Complete	April 1989
Execution of Record of Decision (ROD)	March 29, 1990
Consent Decree (CD) Filed	June 17, 1991
Remedial Action (RA) Start	June 1993
Preliminary Closeout Report	September 25, 1995
Implementation of Groundwater and Surface Water Monitoring Plan	October 31, 1995
Implementation of Erosion Control Plan	August 1, 1996
Final Site Inspection	August 19, 1996
Five Year Review	September 30, 1998

III. BACKGROUND

Physical Characteristics

The DOPC Site occupies approximately 10 acres of land in Escambia County, approximately two miles west of the Town of Cantonment, Florida. The Site is located in a rural agricultural setting. The elevation of the Site ranges from approximately EL 155.00 on the south of the Site to EL 88.00 on the north. The DOPC Site is situated in a recharge area of the regional sand-and-gravel aquifer of the Florida panhandle. The regional aquifer is a sequence of sand, gravel and clay approximately 500 feet thick. Underlying the regional aquifer is a 550 foot thickness of sandy clay. The regional aquifer at the DOPC Site is unconfined to seasonally semi-confined by a locally continuous 30-50 feet thick clay unit. The surficial sands above the clay layer contain a perched water table. Aquifer testing indicated that the perched water table and the regional water table aquifer are poorly connected. Gradients in the perched water table are northerly while gradients in the regional aquifer are westerly.

Surface water features included natural drainage and three man-made ponds built to retain natural spring seepage and stormwater runoff. An intermittent stream extends north from the Site to join a second intermittent stream prior to the confluence with Jacks Branch, one of four Florida tributaries to the Perdido River.

Mean monthly temperatures at the Site range from 52°F in January to 82°F in July, and mean annual precipitation is 61.6 inches. The average wind direction is due south and average wind speed is 7 knots.

Land and Resource Use

The DOPC Site is located in a rural setting. Land use is predominately agricultural, although development of low density housing is encroaching from the east. Residences in the area are served by the Farm Hill Utility District, a community water supply. Tree farms lie west of the Site, while pasture land and undeveloped forest areas lie south and north. Aerial photographs taken in 1980 indicate about 35 residences within ½ mile of the DOPC Site. Eleven residences are located within 1/4 mile of the contaminated soil pit, (the “vault”); the nearest residence is approximately 540 feet south of the center of the vault. The nearest community, Cantonment, a town of about 3,500 people, is about two miles east of the Site. Land use in Cantonment is mixed residential, commercial, and industrial.

Mr. Earl Dubose acquired the Site in late 1977. From January 1979 to November 1981, Mr. Dubose operated the Site as a waste storage, treatment, recycling and disposal facility. The facility used a batch thermal treatment process to recover a usable oil product from waste oil, petroleum refining wastes and oil-based waste solvents. Waste oils were transported to the Site by tanker trucks. Spent solvents and process wastes from petroleum refining and wood treating operations arrived in 55 gallon drums. The drum contents were emptied into treatment tanks, with the empty drums either resold, crushed for resale as scrap metal, or buried onsite.

Contaminants

History and discovery of contamination

In September 1980, Mr. Dubose applied to the EPA for a Resource Conservation and Recovery Act (RCRA) Interim Status permit to operate a treatment, storage and disposal (TSD) facility at the Site. Mr. Dubose continued to operate the facility without an approved permit, and did not inform his clients that he was operating without a permit. In November 1981, Mr. Dubose ceased operations at the Site and dismantled his equipment for transport elsewhere.

In March 1982, the Florida Department of Environmental Regulation (now called the Florida Department of Environmental Protection and abbreviated FDEP) conducted an Interim Status Standards Compliance Inspection at the Site and found Mr. Dubose was preparing to close the Site without an approved closure plan. In April and May 1982, EPA and FDEP sampled the Site and found buried metal objects, contaminated springs and leachate seeps, and an oil sheen on the

North Pond.

In July 1982, Mr. Dubose submitted a closure plan to FDEP. The plan did not meet FDEP's criteria and Mr. Dubose was denied permission to close the Site. In May 1983, FDEP filed a civil complaint against Mr. Dubose alleging that actions by Mr. Dubose had violated surface water quality criteria, posed a threat to local groundwater supplies, violated the Florida Air and Water Pollution Act, violated the Florida Solid Waste Statute, and posed an imminent hazard and immediate danger to human health, safety, welfare and the environment.

In July 1983, Mr. Dubose began operating a treatment system to attempt to remediate onsite surface waters. Since Mr. Dubose did not have the permits to carry out this work as required by Florida law, on August 17, 1983 FDEP filed a motion for a preliminary injunction prohibiting further activities at the Site that posed a risk to public health and safety, and allowing FDEP access to the Site to assess clean-up requirements. In September 1983, the court granted a preliminary injunction in favor of FDEP. When Mr. Dubose failed to submit a proposal for removal of contaminated soils and buried drums by March 5, 1984 as ordered, FDEP filed a motion for contempt and supplementary injunctive relief. On November 2, 1984, the court entered a second consent agreement requiring Mr. Dubose to excavate and secure contaminated materials. Between November 1984 and May 1985, what had been the South Pond area was excavated and lined with a 36 mil PVC liner. The depression was filled with Site soils to approximately 20 feet above surrounding grade and covered with a 30 mil PVC cover. An estimated 38,000 cubic yards of soil was placed in the former pond area, or "vault".

NPL listing

Dubose Oil Products Company Site was proposed for the National Priorities List (NPL) in 1984. It became final on the NPL on June 10, 1986. Following the identification of potentially responsible parties (PRPs), a PRP Steering Committee was formed. The PRP Steering Committee commissioned an outside consultant to develop a work plan for conducting a Remedial Investigation/Feasibility Study (RI/FS) for the Site. The work plan was prepared, and subsequently approved by FDEP in October 1987. On October 26, 1987, a Consent Agreement was reached between FDEP and the PRPs for proceeding with the RI/FS. In January 1988, work began on the RI/FS.

Contaminated media

The Remedial Investigation (RI) began in February 1988 and was completed in October 1988. Results of Site testing indicated low to undetectable levels of semi-volatile organics in soils, sediments and water outside the vault; levels of organic contaminants (volatile, semi-volatiles and phenols) inside the vault were 100 to 1000 times higher. Testing showed no contaminants in groundwater offsite, in air or on wind-blown dust, and no significant levels of contaminants in the regional water table aquifer onsite. Volatile organic contaminants were detected at less than 50 ppb levels in water from the perched water table aquifer and two onsite surface water impoundments.

Volatile organic concentrations in the vault ranged from 22 to 38,270 micrograms per kilogram (µg/kg). Total polynuclear aromatic (TPNA) compounds were detected at concentrations ranging from 578 to 122,400 µg/kg. Pentachlorophenol (PCP) concentrations in the vault ranged from 58 to 51,000 µg/kg. Trichloroethene (TCE) was detected in two deep vault samples at concentrations of 170 µg/kg and 310 µg/kg.

Onsite soils generally were found to be below detectable levels for organics of concern; however, six areas (“hot spots”) outside of the vault area had detectable levels of volatile and semi-volatile organic compounds. Polynuclear aromatic (PNA) compounds constituted the majority of contamination found in DOPC soils.

Risk assessment

The following complete pathways of exposure were identified for the baseline risk assessment: dermal exposure to surface water onsite, dermal exposure to surface water offsite, dermal exposure to sediments in the tributary to Jacks Branch, ingestion of soils onsite, ingestion of surface water onsite and ingestion of sediments in the tributary to Jacks Branch. Potential receptors for these six pathways are children aged 3 to 12, both as trespassers and family members residing near the Site. An exposure pathway through groundwater could exist if no remediation occurred, the vault liner failed, or the Site had been developed for residences that do not utilize public water supplies. There was also a very long-term possibility that without remediation, contaminants might migrate offsite and emerge from groundwater into the tributary to Jacks Branch.

IV. DEVELOPMENT AND IMPLEMENTATION OF THE REMEDY AND OPERATION AND MAINTENANCE

Remedy Selection

The small ponds and the perched water table discharge directly into the North Pond so cleanup objectives for Site waters were developed for the North Pond discharge. The point where water exits the North Pond discharge pipe was considered to be “offsite” and was the point where water Applicable or Relevant and Appropriate Requirements (ARARs) were applied.

The cleanup goals for TCE, 1,1-Dichloroethene (DCE), TPNAs, and xylenes were based primarily on potential leaching of these materials from soils into the perched water table and migrating to the North Pond. The cleanup goals for PCP and benzene were based on health based criteria that are protective of human health. These cleanup goals also would prevent contaminant levels in groundwater from exceeding drinking water standards. The following table presents the Remedial Action Objectives (RAOs) for surface water and soil.

Contaminant	RAOs - surface water	RAOs - soil cleanup
TNPAs	10 µg/l	50 mg/kg
Pentachlorophenol (PCP)	30 µg/l	50 mg/kg
Xylenes	50 µg/l	1.5 mg/kg
Benzene	1 µg/l	10 mg/kg
Trichloroethene (TCE)	3 µg/l	0.050 mg/kg
1,1-Dichloroethene (DCE)	7 µg/l	0.070 mg/kg

The Feasibility Study (FS) report evaluated ten alternatives for the remediation of the DOPC Site: (1) No action, but long-term water monitoring, (2) Site regrading, capping and long-term water monitoring, (3) Offsite landfill, Site regrading and topsoil cover, (4) Onsite landfill, Site regrading, leachate treatment, and long-term water monitoring, (5) Pozzolanic treatment, Site regrading, topsoil cover, and long-term water monitoring, (6) Soil washing, wastewater treatment, Site regrading, topsoil cover, and short-term water monitoring, (7) In situ biological treatment, wastewater treatment, Site regrading, topsoil cover, and short-term water monitoring, (8) Composting/windrowing, wastewater treatment, Site regrading, topsoil cover, and short-term monitoring, (9) Combination of alternatives 7 and 8, (10) Onsite incineration, Site regrading, and topsoil cover.

The Record of Decision (ROD), signed on March 29, 1990, determined cleanup at the Site was needed and determined the selected remedy, (8) Composting/windrowing, wastewater treatment, Site regrading, topsoil cover, and short-term monitoring, would adequately protect public health, welfare, and the environment. This remedy would also not allow for further contamination of the groundwater.

The major components of the remedy included:

- Excavation of non-contaminated soil in the vault and placement in the ravine.
- Transformation of the hog barn area into a bioremediation treatment facility.
- Excavation and bioremediation treatment of contaminated vault soils and disposal in the ravine.
- Draining and filling of the onsite ponds.
- Placement of a two foot topsoil layer over the ravine and former pond area, final grading and vegetation.
- Installation of surface water runoff controls to accommodate seasonal precipitation.
- Groundwater monitoring.
- Additional soil sampling during the remedial design to confirm the location of “hot spots” of contaminated soil outside the vault.
- Deed restrictions to preclude inappropriate future land use.

Remedy Implementation

The Remedial Design/Remedial Action (RD/RA) Work Plan was approved in April 1992. The Remedial Action commenced in May 1993 by the RA Contractor, Waste Abatement Technology, L.P. (WATEC) selected by the DOPC Steering Committee. The Remedial Design was prepared according to the ROD and the design was implemented according to the approved RD/RA Work Plan.

The installation of the wastewater plant was completed in October 1993 and the construction of Site controls and temporary facilities was completed in November 1993. The bioremediation of onsite soils that failed RAOs for VOCs and TPNAs, began January 10, 1994 and was completed September 9, 1994. The biotreatment facility leachate was collected and treated onsite monthly before it was discharged. The North Pond and Leachate Pond were then drained. The Preliminary Closeout Report was submitted on September 25, 1995 and the Final Site Inspection was held on August 19, 1996. In September 1996, the Remedial Action Report was submitted to EPA which documented that the soil had been cleaned to achieve Remedial Action Objectives (RAOs), and the natural attenuation remedy for the Site groundwater and surface water was operational and functional.

Operation and Maintenance (O&M) Requirements

Operation and Maintenance (O&M) for the Site include maintenance of the Site grading/drainage and implementation of the Groundwater and Surface Water Monitoring Plan. On August 21, 1995, the Groundwater and Surface Water Monitoring Plan was approved and its implementation commenced on October 31, 1995. The Erosion Control Implementation Plan was approved May 10, 1996 and the construction of the erosion control measures was initiated on June 27, 1996.

The Groundwater and Surface Water Monitoring Plan's strategy consists of an initial round of sampling of all groundwater monitoring wells, quarterly sampling of selected groundwater monitoring wells within or downgradient of the Site, quarterly sampling of two surface water locations, and annual sampling of selected upgradient groundwater monitoring wells. The samples are collected and analyzed for selected volatile and semi-volatile compounds. A report of the results of the analyses is submitted to the EPA each quarter. Groundwater and surface water monitoring will continue until it is determined by the EPA that remedial action objectives are achieved.

The Erosion Control Plan was developed to remedy the surface erosion that occurred at the DOPC Site and to minimize potential erosion. The plan presents additional surface water diversion structures, additional surface water conveyance structures, and remedial actions such as regrading and revegetating the areas impacted by surface drainage. The erosion control measures recommended by the Escambia Soil and Water Conservation District (ESWCD) for the Site provided the basis for the plan. Erosion controls include diversion berms, surface and subsurface drains, underground pipes for surface water conveyance, and grading and reestablishing vegetative cover in areas of concern at the Site. During quarterly monitoring events, the

integrity of the soil cover on the treated soils is assessed for impacts from erosion. If significant erosion occurs, a corrective action is developed and implemented to ensure the erosion is controlled and the cover meets the objectives of isolating the treated materials. Further, the erosion and sediment control measures implemented are monitored for proper and intended operation, including ensuring the integrity of diversion berms, unclogging of surface drain riser pipes, and ensuring unhindered discharge from the underground pipes.

O&M Activities

O&M activities began October 31, 1995 when the Groundwater and Surface Water Monitoring Plan was first implemented. The O&M requirements under the Erosion Control Plan became effective August 1, 1996. The PRPs are responsible for developing, funding, and implementing all O&M activities under EPA oversight. Quarterly groundwater and surface water monitoring sampling events have occurred consistently at the Site, as well as quarterly maintenance checks on Site drainage features. Quarterly reports including the groundwater and surface water analyses, chemical data sheets, time/concentration plots, and summaries of the field activities are sent to EPA and FDEP each quarter for review. In addition to the quarterly reports, monthly progress reports are submitted by the DOPC Steering Committee to EPA and FDEP; they include summaries of actions taken to comply with the consent order, status of sampling results received, plans and procedures completed, work planned for the upcoming month, and any problems, anticipated problems and solutions that occurred in the previous month.

In February 1998, the carbon used to treat the wastewater leachate was removed from the treatment facility vessels and properly disposed of at an offsite landfill. Earl Dubose inspected and accepted possession of both empty containment vessels.

V. FIVE-YEAR REVIEW FINDINGS

Five-Year Review Process

The five-year review was conducted by Randa Chichakli, EPA's Remedial Project Manager for the DOPC Site. The review began April 1, 1998 with a document review of the ROD, Consent Decree, Preliminary Close Out Report, Remedial Action Report, Groundwater and Surface Water Monitoring Plan, Erosion Control Implementation Plan, Quarterly Monitoring Reports, Monthly Progress Reports, and Federal ARARs. State ARARs were reviewed by GeJuan Prime, FDEP's Project Manager for the DOPC Site. A Five-Year Review Fact Sheet was distributed to the community explaining the five-year review process and requesting their input and comments. Members of Parsons Engineering Science, Inc. (PRP contractor), the Soil Conservation Services Molino Office, and the community were interviewed by telephone about the Site. A Site visit was also conducted.

Interviews

Ken Collar of the Soil Conservation Services (SCS) Molino Office was interviewed May 5, 1998 about the DOPC Site. Mr. Collar and his office had been involved in developing the Erosion Control Implementation Plan. Upon completion, he was satisfied with the construction of the erosion controls measures and approves of the continuing monitoring of Site drainage controls.

Ken Stockwell and Laura Kelly of Parsons Engineering Science, Inc. (PRP contractor) were contacted throughout the five-year review process. Ms. Kelly is the current project manager for the DOPC Site and oversees the O&M activities. Mr. Stockwell was the project manager for the Site through July 1997. Both are satisfied with the implementation and continued operation of the groundwater and surface water monitoring plan and the erosion control plan.

Earl Dubose, the property owner, was given an opportunity for an interview with EPA during the Site visit and over telephone, but he was not present at the Site visit and did not respond to EPA to request or schedule a phone interview.

Johnny Whitehurst, a community member who owns the adjacent property north/northeast of the DOPC Site, was interviewed May 26, 1998. He was concerned about the effects of runoff from the DOPC Site to his adjoining property. He said water from the DOPC Site was flowing north, through the east/west fence, and destroying the vegetation on his property boundary.

Site Visit

A Site visit was conducted on May 28, 1998 for the purpose of this five-year review. Randa Chichakli (EPA), Ken Stockwell (Parsons Engineering Science, Inc.), Theodore Craver (Litton Corporate - member of the DOPC Steering Committee), Troy Brumfield and Robert Ariatti (Litton-Ingalls Shipbuilding - member of the DOPC Steering Committee) were present for the Site visit. The visit was held during a quarterly sampling event and two members of Parsons' sampling team were present conducting the sampling.

Ken Stockwell led a walking tour of the 10 acre Site, answered questions about the history of the Site, and described the continuing O&M efforts at the Site. Photographs were taken by Randa Chichakli (included in Attachment A).

Overall, the Site has good vegetative cover (Photograph 1). The empty carbon vessels and wastewater treatment equipment are still onsite under the ownership of Earl Dubose (Photograph 2). There are two main pond areas on the Site, the North Pond (Photograph 3) to where most of the Site drains before it is discharged offsite, and a smaller pond/marsh in the southern region of the Site (Photograph 4). The diversion berms and the surface drains are in good condition (Photographs 5-8). The surface drain pipe at the connection of Subsurface Pipes 3 and 4 (Photograph 9) appeared to be disconnected and nonfunctional. Maintaining this surface pipe is the responsibility of Mr. Dubose and he was contacted about the problem. Along the north edge of the Site at the Dubose/Whitehurst property boundary, the vegetation is in good condition and

there appears to be no serious erosion problems to the adjacent Whitehurst property resulting from runoff of the DOPC Site (Photograph 10).

The onsite groundwater monitoring wells and surface collection points were identified during the tour and appeared to be in good, well-maintained condition. The fencing around the property was undamaged and functional, controlling access to the Site.

Overall, the Site visit demonstrated that the implementation of O&M activities was carried out in accordance with the ROD. The O&M activities are supporting an effective remedy at the DOPC Site, and there have been no unexpected changes in cost or scope of the O&M that might suggest compromised effectiveness of the remedy.

Remedial Action Objectives Review

The 1990 ROD identified the following contaminant-specific ARARs for the DOPC Site: Drinking Water Maximum Contaminant Levels (MCLs), Federal Ambient Water Quality Criteria, National Ambient Air Quality Standards (NAAQS) and state environmental standards. These ARARs are for contaminants in surface water or groundwater. There are no contaminant-specific ARARs for soils or sediments at the Site. The soil was cleaned to achieve RAOs in September 1996. This RAO review focuses mainly on contaminants in surface water and groundwater since there have been no apparent leaching problems since the completion of the soil cleanup.

There are no sensitive environments (wetlands), endangered species habitats (aquatic and terrestrial), historical sites, or floodplains affected by the DOPC Site; therefore, no location-specific ARARs apply to the Site. Action-specific ARARs included the Resource Conservation and Recovery Act (RCRA), Clean Water Act, Clean Air Act, and certain Florida state laws. To be considered (TBC) criteria included the “to be proposed” MCLs and MCLGs for xylene of 10 mg/L.

The following table compares the RAOs from the ROD to the current state and federal ARARs:

Record of Decision				Current		
<i>Contaminant</i>	<i>RAO</i>	<i>Source</i>	<i>Year</i>	<i>ARAR</i>	<i>Source</i>	<i>Year</i>
*Benzopyrene	10 µg/l	Achievable detection limit for total polynuclear aromatics	1990	0.2 µg/l	Florida Groundwater Standard	1998
PCP	30 µg/l	Florida Groundwater Standard	1990	1 µg/l	Florida Groundwater Standard	1998
Xylenes	50 µg/l	Florida Groundwater Standard	1990	20 µg/l	Florida Secondary Groundwater Standard	1998

*The 1990 ROD set the RAO for polynuclear aromatics at 10 µg/l, the achievable detection limit for total PNAs in water according to USEPA Method 8270. Florida now has an individual standard for benzopyrene of 0.2 µg/l.

The Site visit, interviews, and quarterly monitoring reports were used to review the current Site characteristics. There have not been significant changes in the Site that would affect the protectiveness of the RAOs. The contaminants of concern remain the same, as well as the land usage and human usage of resources.

There have been significant changes in the Florida Groundwater Standards (as seen in the table above). The existing remedy for groundwater and surface water relies on natural attenuation and has proven effective in achieving the 1990 ROD RAOs. The new, more stringent, cleanup standards continue to be met during routine quarterly sampling for benzopyrene and xylenes. The current Florida Groundwater Standard for PCP of 1 µg/l was exceeded in 1995 at the point of compliance but has been below detection limits since then. The existing remedy meets the new standards and protectiveness of human health and the environment is not called into question.

Data Review

Quarterly groundwater and surface water monitoring data is available from October 1995, the date of implementation of the groundwater and surface water monitoring plan. Scattered data is also available from 1993, the start of the Remedial Action. The quarterly monitoring data is discussed generally in the following narrative. Appendix B includes a table that shows maximum detections for groundwater and surface water and time/concentration plots of sampling locations that have exceeded at least one standard (plots and table were developed by Parsons Engineering, the PRP contractor).

Each quarter, nine locations are sampled by Parsons Engineering - two surface water discharge points and seven groundwater monitoring wells. The results are submitted quarterly to EPA, FDEP, and the PRPs for review. Since the November 1995 sampling event, analytes have been found above detection limits during at least one sampling round in monitoring wells 15S, 15D, and 3S, and at SF1 and SF2 discharge points (see map of DOPC Site - Appendix C).

Wells 15S and 15D are located near the pond/marsh area in the southern end of the Site. Well 15D is at a depth of 122 feet. PCP was detected in 15D at 1.1 µg/l in November 1995 (time/concentration plot 1) and benzene was detected in 15D at 1.3 µg/l in November 1996 (time/concentration plot 2). Both analytes have not exceeded the detection limits at this location since these dates. Well 15S is at a depth of 37 feet. Xylenes and polynuclear aromatics, including 2-methylnaphthalene, acenaphthene, anthracene, fluorene, naphthalene, and phenanthrene have been detected in well 15S but have never exceeded any state or federal standards. Pentachlorophenol (PCP) was detected in November 1995 at 1.1 µg/l in well 15S (time/concentration plot 3), but has not gone above the detection limit since.

SF1, the surface water discharge point at the southern end of the Site has detected DCE, xylenes, and polynuclear aromatics, including 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, fluorene, and phenanthrene; all have been below federal and Florida groundwater standards. Trichloroethylene (TCE) is consistently detected at this point, ranging from 4.5 µg/l to 190 µg/l (time/concentration plot 4). PCP has also been frequently detected in the SF1 samples

with a maximum level of 18 µg/l during the May 1998 sampling event (time/concentration plot 5).

The North Pond discharge water is monitored at the SF2 sampling point. All SF2 samples since the completion of the soil cleanup have been non-detect for the target compounds except for a 1996 sample that indicated PCP was present at 1.5 µg/l. PCP has not been detected at SF2 again (time/concentration plot 6).

The North Pond discharge water has been in compliance with the cleanup goals set in the ROD (RAOs - Section IV) since 1996. The natural attenuation remedy for the Site groundwater and surface water appears to be effective and future compliance can be expected without additional action.

VI. CONCLUSIONS

Appropriateness of Remedial Action Objectives

The Remedial Action Objectives Review in Section V of this report presents a table showing the changes in federal and state ARARs since the 1990 ROD. The Florida Groundwater Standards are currently lower for some of the contaminants of concern at the Site. Quarterly monitoring has shown that even with the more stringent ARARs of 1998, the groundwater and surface water have been below all state and federal standards since 1996.

EPA has determined that the remedy is still protective of human health and the environment and the RAOs from the 1990 ROD do not need to be modified unless a significant change occurs that jeopardizes this protectiveness.

Achievement of Remedial Action Objectives

At the end of five years of quarterly sampling a statistical analysis will be performed to determine if RAOs for Site groundwater and surface water have been met. Past quarterly monitoring has shown the natural attenuation trend appears to be effective and the remedy will achieve the cleanup goals specified in the ROD.

Whether the Remedy is Effective and Functioning as Designed

The remedy at the DOPC Site is effective and functioning as designed to protect human health and the environment. This conclusion is based on many of the factors discussed in this review. The Site visit demonstrated that the implementation of O&M activities was carried out in accordance with the ROD. The O&M activities are supporting an effective remedy at the Site, and there have been no unexpected changes in cost or scope of the O&M that might suggest compromised effectiveness of the remedy. Finally, based on the data review of quarterly monitoring results, the North Pond discharge water has been in compliance with the cleanup goals

set in the ROD (RAOs - Section IV) since 1996. The natural attenuation remedy for the Site groundwater and surface water appears to be effective and future compliance can be expected without additional action.

Adequacy of O&M

All the original Operation and Maintenance requirements are adequate for the Site and are being implemented properly. Quarterly monitoring of groundwater and surface water is effectively ensuring the remedy is performing properly and does not need to be changed.

Early Indicators of Potential Remedy Failure

There are no early indicators of problems that could lead to remedy failure or show that protectiveness is at risk at the DOPC Site.

VII. DEFICIENCIES

No deficiencies were found during the five-year review for the DOPC Site that prevent the remedy from being protective.

VIII. RECOMMENDATIONS

EPA recommends continuing quarterly monitoring and erosion control under the original O&M Plan until RAOs are achieved as specified in the ROD.

IX. PROTECTIVENESS STATEMENT

Upon completion of the remedial action, the remedy is expected to meet the requirements of the ROD to ensure protectiveness. While the remedial action is still underway, the remedy remains protective of human health and the environment through quarterly monitoring of onsite groundwater and onsite and offsite surface water discharge.

Attachment A
Photographs
Site Visit - May 28, 1998

Photograph 1: South end of DOPC Site - concrete barn.

Photograph 2: Wastewater treatment equipment and empty carbon vessels.

Photograph 3: North Pond and wastewater treatment equipment.

Photograph 4: Pond/marsh area in southern region of DOPC Site.

Photograph 5: Diversion Berm #5.

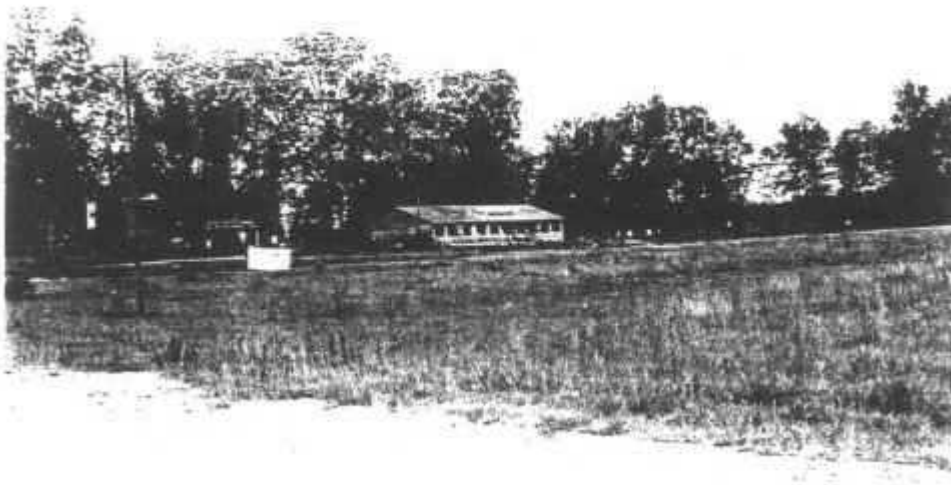
Photograph 6: Pond/marsh drain into North Pond.

Photograph 7: Surface drain pipe into North Pond.

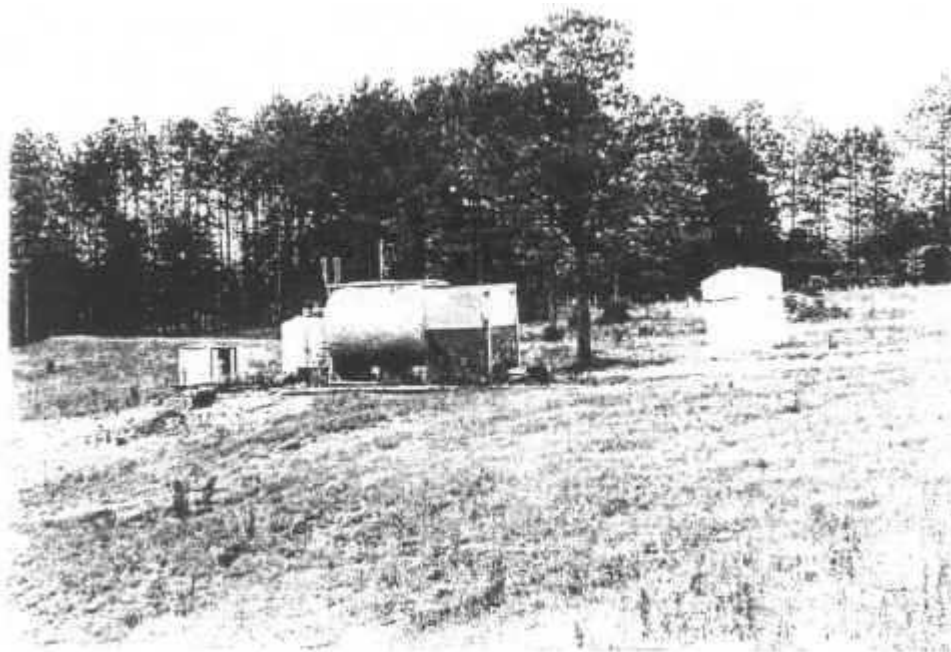
Photograph 8: Point of compliance - discharge (SF-2) from North Pond into Jack's Creek.

Photograph 9: Surface drain pipe from Subsurface Pipes 3 and 4.

Photograph 10: Northern property boundary between DOPC Site and Whitehurst property.



Photograph 1: South end of DOPC Site - concrete barn



Photograph 2: Wastewater treatment equipment and empty carbon vessels



Photograph 3: North Pond and wastewater treatment equipment



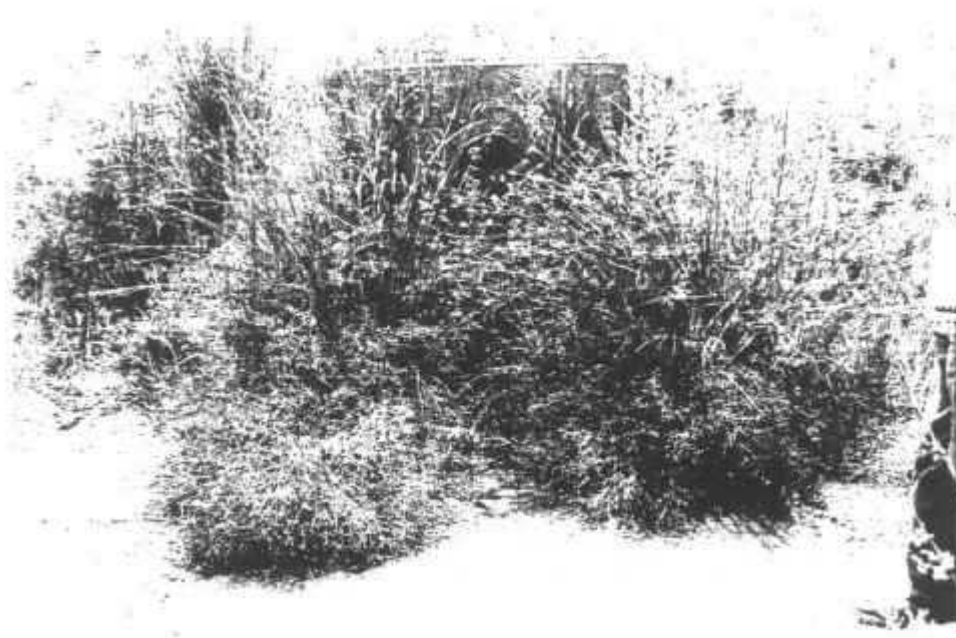
Photograph 4: Pond/marsh area in southern region of DOPC Site



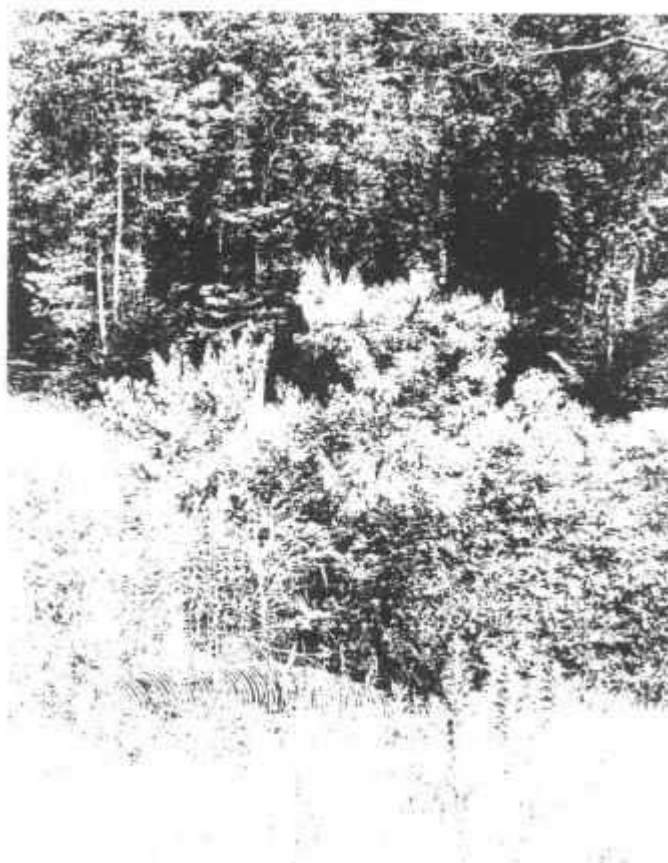
Photograph 5: Diversion Berm #5



Photograph 6: Pond/marsh drain into North Pond



Photograph 7: Surface drain pipe into North Pond



Photograph 8: Point of compliance - discharge from North Pond into Jack's Creek



Photograph 10: Northern property boundary between DOPC Site and Whitehurst Property



Photograph 9: Surface drain pipe from Subsurface Pipes 3 and 4

Attachment B
Table
Time/Concentration Plots

1. Table 1: Maximum Detections For Groundwater and Surface Water Analysis
2. Time/Concentration Plot 1: Monitoring Well MW 15D - Pentachlorophenol
3. Time/Concentration Plot 2: Monitoring Well MW 15D - Benzene
4. Time/Concentration Plot 3: Monitoring Well MW 15S - Pentachlorophenol
5. Time/Concentration Plot 4: Surface Water Location SWD-SF1 - Trichloroethylene
6. Time/Concentration Plot 5: Surface Water Location SWD-SF1 - Pentachlorophenol
7. Time/Concentration Plot 6: Surface Water Location SWD-SF2 - Pentachlorophenol

TABLE 1

**Table 2. Maximum Detections
For Groundwater and Surface Water Analyses
Dubose Oil Products Company Site**

	Remedial	SWD-SF1		MW15S		MW15D		North Pond	
	Action							Discharge(SF2)	
	Objectives ⁽¹⁾	Maximum	Date	Maximum	Date	Maximum	Date	Maximum	Date
Purgeable Halocarbons (EPA 601) µg/l									
1,1-Dichloroethene	7	1.8	11/6/96	U		U		U	
Trichloroethylene	3	190	5/6/97	U		U		U	
Tetrachlorethene	NS	6.4	10/31/95	U		U		U	
Purgeable Aromatics (EPA 602) µg/l									
Benzene	1	U		U		1.3	11/6/96	U	
Xylenes	50	2.3	8/13/96	9.4	9/15/97	U		U	
Polynuclear Aromatics (SW8310) µg/l	10 (total)								
Acenaphthylene		1.8	11/18/97	U					
Acenaphthene		6.4	5/6/97	1.6	11/6/96	U		U	
Anthracene		0.97	5/6/97	0.56 ⁽²⁾	11/6/96	U		U	
2-Methylnaphthalene		1.2	2/11/97	10	11/19/97	U		U	
Fluorene		3.6	5/6/97	1.4 ⁽²⁾	11/6/96	U		U	
Naphthalene		U		3.7	5/14/96	U		U	
Phenanthrene		0.65	5/6/97	1.4 ⁽²⁾	5/14/96	U		U	
Total PNAs		11.62	5/6/97	15.78	11/19/97	U		U	
Chlorinated Herbicides (SW8151) µg/l									
Pentachlorophenol	30	18	5/27/98	1.1	10/31/95	1.1	10/31/95	1.5	8/13/96

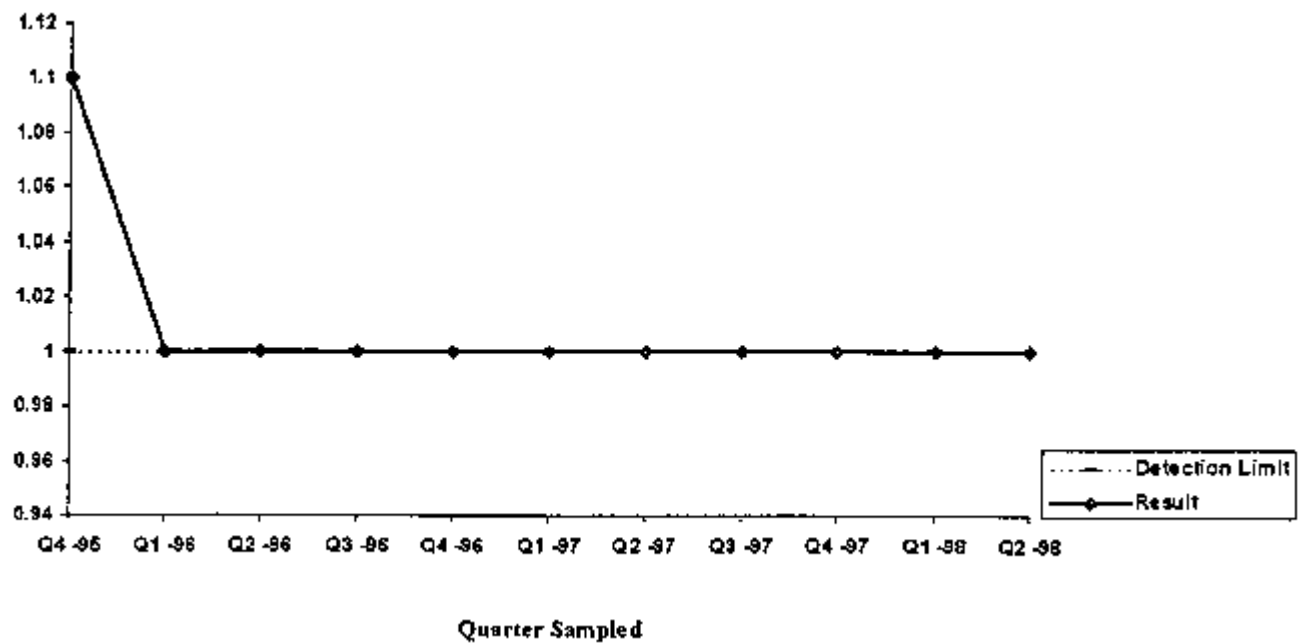
(1) - For North Pond discharge

(2) - Value reported from the field duplicate analysis

U - Not detected above the reporting limit

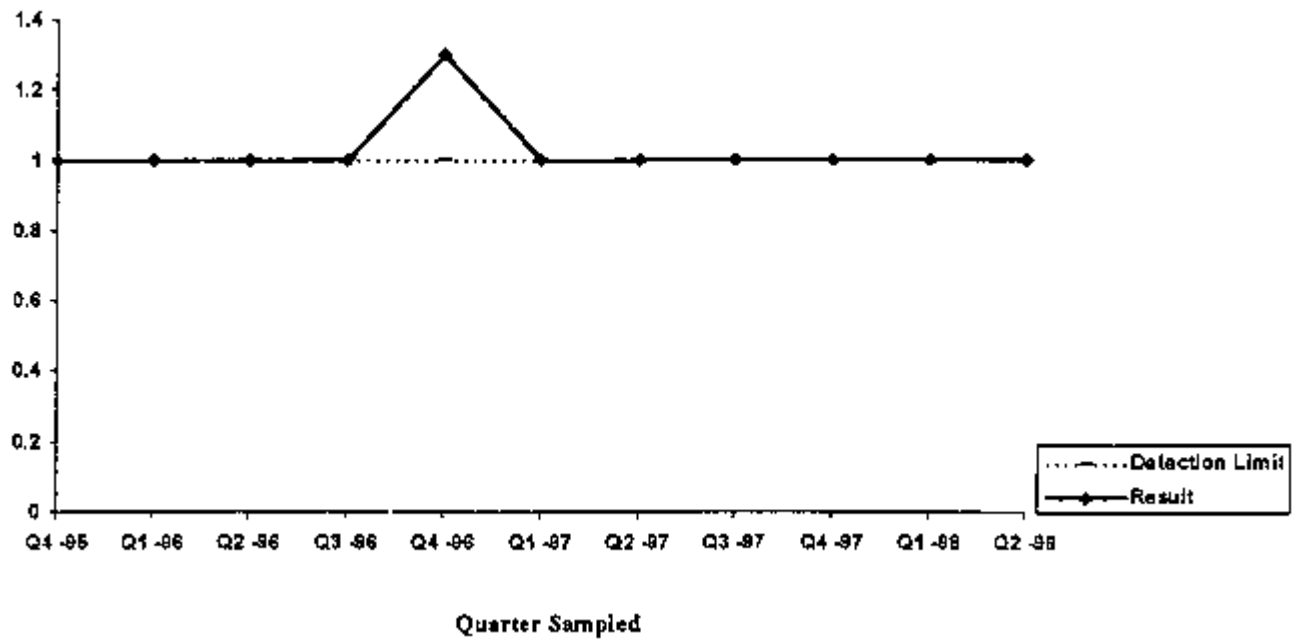
TIME/CONCENTRATION PLOT 1
Monitoring Well MW15D
Pentachlorophenol (ug/L)
Concentration Vs Time

Detection Limit (except where noted): 1 ug/L



TIME/CONCENTRATION PLOT 2
Monitoring Well MW15D
Benzene (ug/L)
Concentration Vs Time

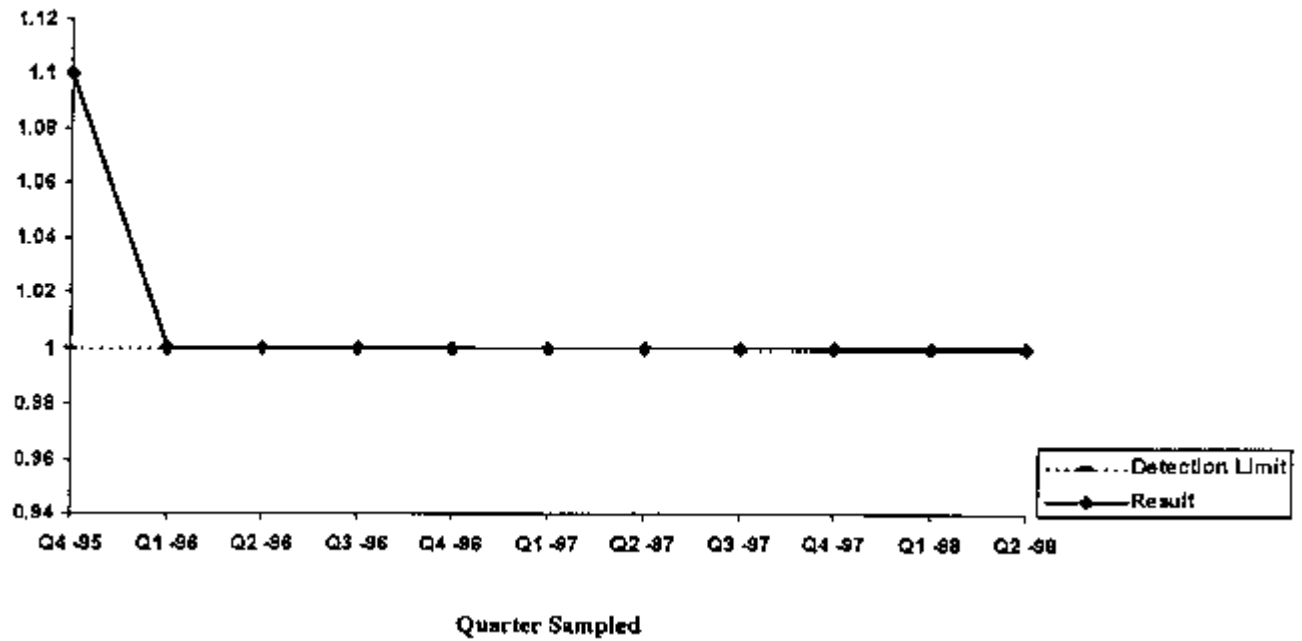
Detection Limit (except where noted): 1 ug/L



TIME/CONCENTRATION PLOT 3

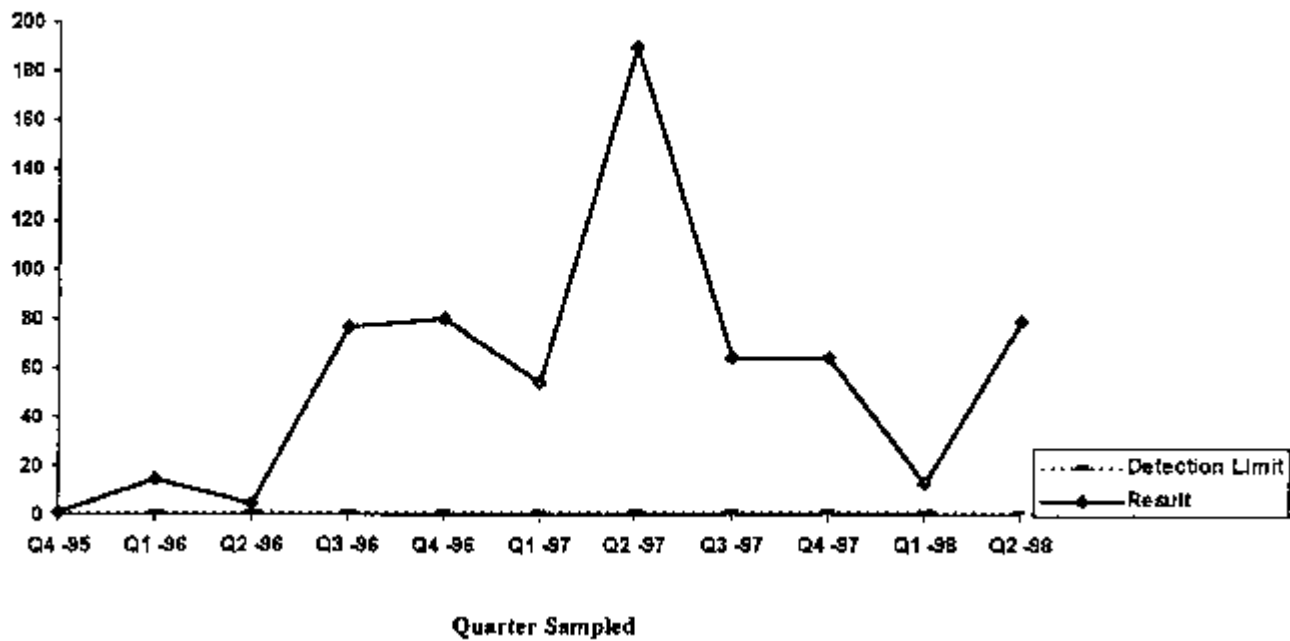
Monitoring Well MW15S
Pentachlorophenol (ug/L)
Concentration Vs Time

Detection Limit (except where noted): 1 ug/L



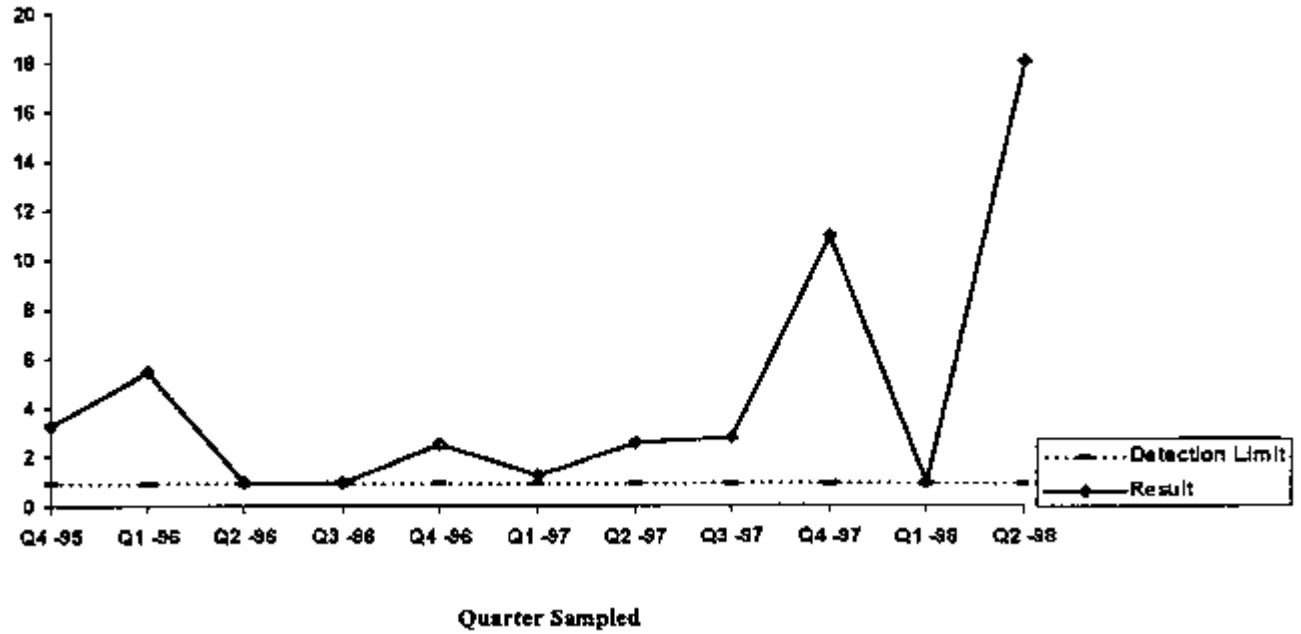
TIME/CONCENTRATION PLOT 4
Surface Water Location SW-SF1
Trichloroethylene (ug/L)
Concentration Vs Time

Detection Limit (except where noted): 1 ug/L



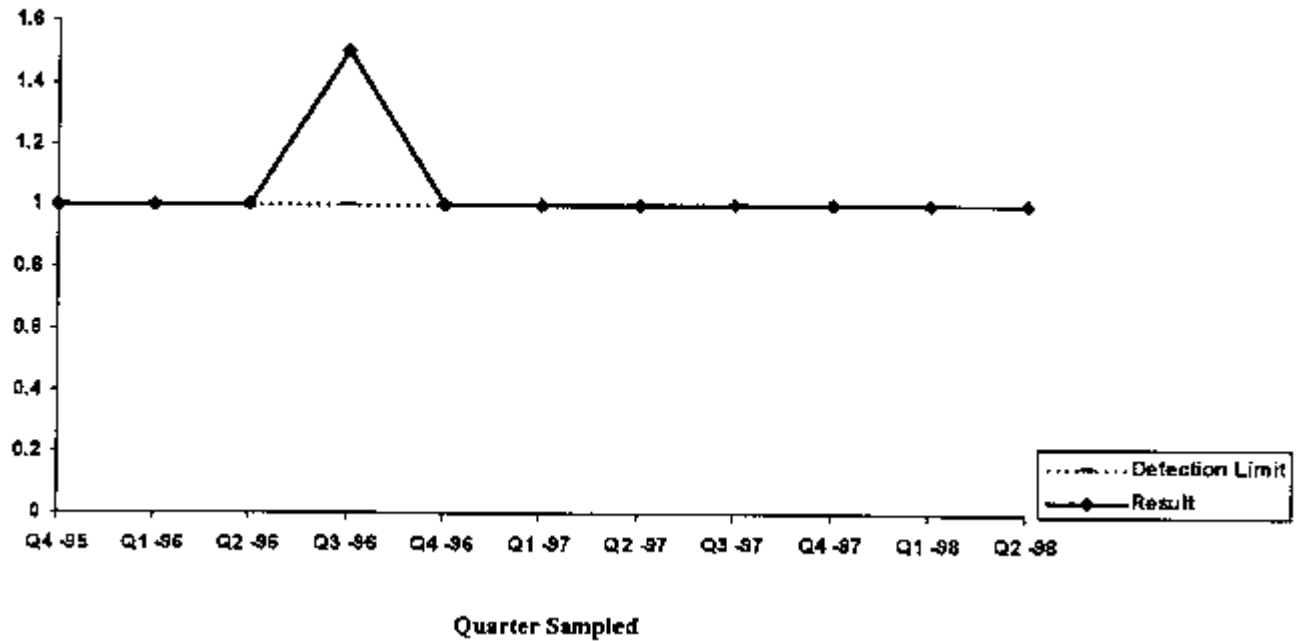
TIME/CONCENTRATION PLOT 5
Surface Water Location SWD-SF1
Pentachlorophenol (ug/L)
Concentration Vs Time

Detection Limit (except where noted): 1 ug/L



TIME/CONCENTRATION PLOT 6
Surface Water Location SWD-SF2
Pentachlorophenol (ug/L)
Concentration Vs Time

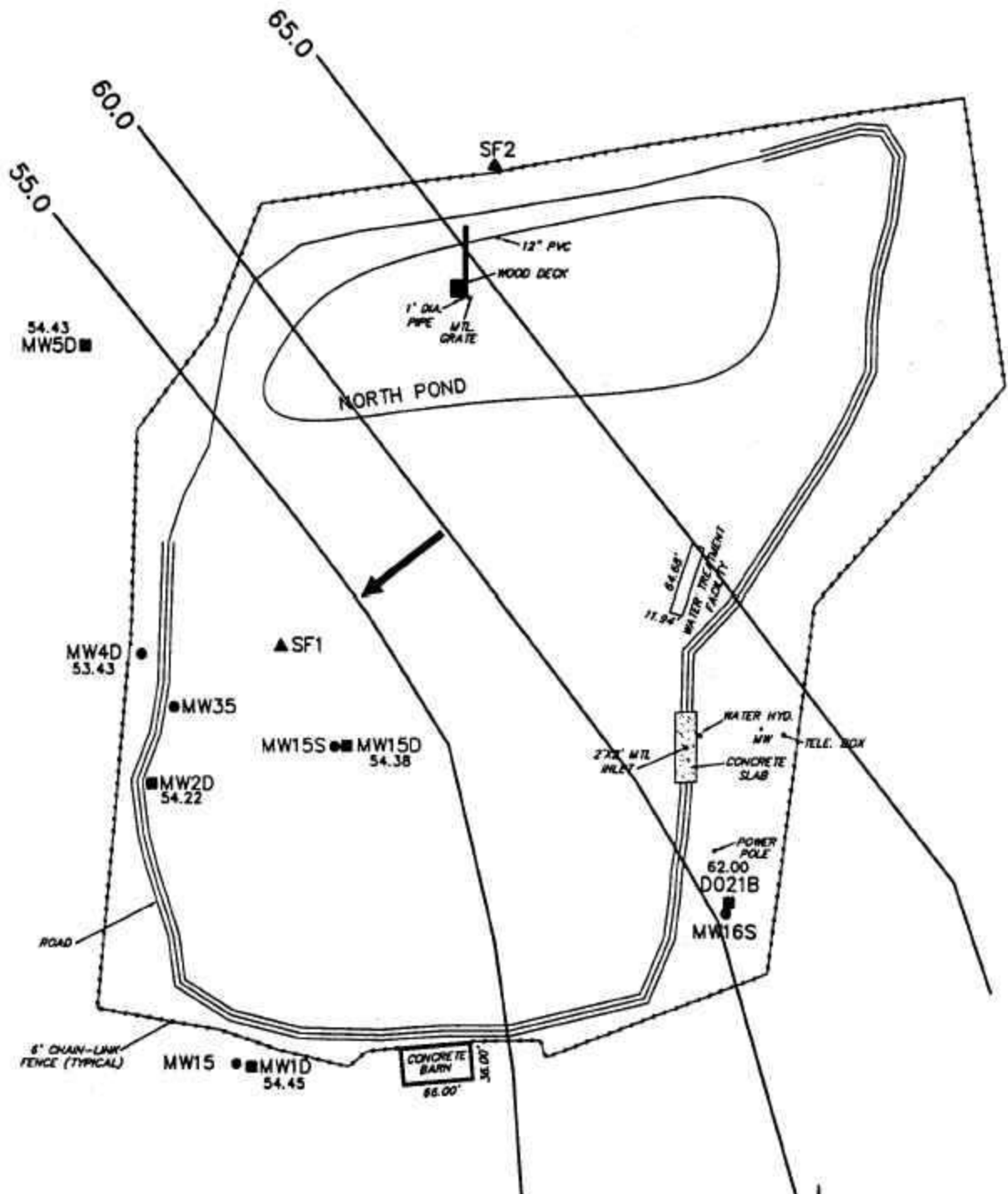
Detection Limit (except where noted): 1 ug/L



Attachment C

Map of Dubose Oil Products Company Site

Figure 2
POTENTIOMETRIC SURFACE
REGIONAL WATER TABLE AQUIFER
DUBOSE OIL PRODUCTS COMPANY SITE
FIRST QUARTER 1998



LEGEND

- SHALLOW MONITORING WELL
- DEEP MONITORING WELL
- ▲ SURFACE WATER SAMPLING LOCATION

— 60 — POTENTIOMETRIC CONTOUR IN FEET ABOVE MSL

→ GROUNDWATER GRADIENT

BASE FROM MAY 4, 1995 SURVEY

PROJECT LOCATION: 11/15/98 11/15/98



PARSONS ENGINEERING SCIENCE, INC.